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MEDICAL NEWS LETTER

Vol. 43 Friday, 3 January 1964 No. 1

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Policy

The U. S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they, susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

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Please forward changes of address for the News Letter to: Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda, Maryland, giving full name, rank, corps, and old and new addresses.

The issuance of this publication approved by the Secretary of the Navy on 28 June 1961.

I-M-P-O-R-T-A-N-T N-O-T-I-C-E

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—Editor

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Commanding Officer, U. S. Naval Medical School
National Naval Medical Center
Bethesda, Md., 20014
(Attn: Addressograph Office)

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COMPARATIVE TRIAL OF CHEMOTHERAPY AND RADIOTHERAPY IN PATIENTS WITH NONRESECTABLE CANCER OF THE LUNG *

Melvin J. Krant MD, Thomas C. Chalmers MD, Margarida M. Dederick MD, Thomas C. Hall MD, Martin B. Levene MD, Hugo Muench MD and Dr P.H., Bruce I. Shnider MD, G. Lennard Gold MD, Charles Hunter MD, Solomon R. Bersack MD, Albert H. Owens Jr, MD, Natividad de Leon MD, Robert J. Dickson MD, Clyde Brindley MD, Kirkland C. Brace MD, Emil Frei III MD, Edmund Gehan Ph D, and Leonard Salvin M S. Amer J Med 35(3): 363-373, September 1963.

Cancer of the lung continues to be a major health problem for which little successful therapy has been devised to date. The over-all curative results with surgery continue to be poor, the 5-year survival rate being 5% to 12%. As a member of the Eastern Cooperative Group in Solid Tumor Chemotherapy, the Lemuel Shattuck Hospital conducted a preliminary trial in 1958 in which supervoltage radiotherapy was compared to mechlorethamine (nitrogen mustard) therapy in patients with inoperable carcinoma of the lung. This study indicated that radiotherapy was superior to mechlorethamine therapy alone in causing transient shrinking of the pulmonary tumor, although survival was unaffected. Thereupon, the group undertook a cooperative study to compare the therapeutic efficacy of three treatment schedules.

There were three "treatment groups": Group I consisted of patients given radiation therapy alone, in a dosage of 4000 r to tumor tissue. Group II included patients given radiotherapy and mechlorethamine treatment simultaneously. Group III was comprised of patients given mechlorethamine followed by radiotherapy. The study attempted to answer three questions: (1) Was early radiotherapy repeatedly superior to early mechlorethamine therapy in causing shrinkage of the lung cancer? (2) Did the simultaneous or prior administration of mechlorethamine with radiotherapy augment the shrinkage of the tumor mass? (3) Did mechlorethamine therapy affect distant overt and occult metastases and thus extend survival time?

This report is the analysis of findings in 219 patients so treated from October 1958 to February 1961. Of this group, 196 (89%) had received no prior therapy except for explorative surgery. A preliminary report of the results has been published (1).

Method of Study

Four member institutions cooperated in placing patients in the study: The District of Columbia General Hospital (Georgetown University Service) and Mt. Alto Veterans Administration Hospital; Johns Hopkins Hospital; National Cancer Institute; and Lemuel Shattuck Hospital. All patients admitted to these hospitals were considered for the study when the following criteria were met: (1) biopsy proof of inoperable or recurrent bronchogenic carcinoma of any

histologic type; (2) existence of a pulmonary lesion visible on roentgenograms but not necessarily clearly measurable; (3) any previous treatments with either radiotherapy or alkylating agents (one course only) concluded at least 6 weeks before the start of the study and not administered as part of the study by members of this group; (4) not under active treatment with antibiotics at the time of entry into the study; and (5) acceptable to the radiotherapist for immediate or delayed therapy. The names of all patients seen by the investigators as potential candidates for the study were entered in a logbook maintained in each institution. Reasons for exclusion of a patient from the study were noted.

Following acceptance for the study, the patients were divided into three groups: (1) those who had prior radiotherapy; (2) those who had prior chemotherapy; and (3) those who had no previous antitumor therapy. For each hospital selection of patients for treatment then was effected by the envelope method, and the patients were placed in the appropriate treatment group. (Selection slips had been arranged predeterminedly by the Biometrics staff at the Cancer Chemotherapy National Service Center.) The envelope could not be opened unless the patient could start therapy promptly. If for any reason the form of therapy assigned subsequently was discontinued, the patient still was considered part of the trial and included in the final tabulation of results.

For purposes of the study, all patients were followed through the course of treatment and subsequently for a total of 90 days after initiation of therapy; thereupon, data continued to be collected but at less frequent intervals with all patients followed up until death, when possible.

A record of such data as weekly weights, performance, symptoms, signs, and laboratory findings was kept and maintained for each patient. In addition, a grid map of the patient's measurable lesions and a flow sheet of sequential measurements were kept as part of the patient's record. These records were mimeographed and submitted to all senior investigators involved in the study for analysis at the time of voting (vide infra). Further details of the mechanics of study may be found in the paper of Zubrod et al (2).

In the original article, the authors present sections on details of treatment, response to treatment, results, intergroup analysis, and comments.

Summary

Two hundred and nineteen patients with carcinoma of the lung were studied in three treatment groups in a cooperative in-hospital study. Of these same patients, 196 had not received prior therapy.

Treatment Group I was given a mean of 3842 tissue r; treatment Group II, a mean of 37.8 mg of nitrogen mustard therapy and 3658 tissue r simultaneously; treatment Group III was given 41.0 mg nitrogen mustard therapy followed by 3633 tissue r.

In evaluating shrinkage in tumor size benefits as determined by votes of the investigators and by over-all survival curves, essentially no beneficial differences emerged for any one treatment group. Toxicity was slightly greater in Group II, and treatment time extended for these same patients.

No difference in toxicity or survival time appeared between 250 kv or 2 Mev radiotherapy equipment.

Data and discussion are presented to indicate that, in this study, survival time is independent of the form of treatment administered, but that natural selection alone determines the patients with longer survivorship. The routine use of radiotherapy and mechlorethamine treatment, therefore, is questioned.

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* Reported as a study by the Eastern Cooperative Group in Solid Tumor Chemotherapy (see Acknowledgement for participating members) from the Medical, Radiological, and Biostatistical Departments, Lemuel Shattuck Hospital, Department of Public Health, Commonwealth of Massachusetts, Boston, Mass; Medical and Radiological Departments, District of Columbia General Hospital, and Mt Alto Veterans Administration Hospital, Washington, D. C. ; Medical and Radiological Departments, Johns Hopkins Hospital, Baltimore, Md. ; and the Medical, Radiological, and Biostatistical Departments, National Cancer Institute, Bethesda, Md. This study was supported by Grants CYP-2820, CYP-2824, and CA-02823-07 from the National Cancer Institute.

Acknowledgement: The Eastern Cooperative Group in Solid Tumor Chemotherapy includes the following members: Drs Dr Krant, Chalmers, Dederick, Hall, Levene, and Muench from the Lemuel Shattuck Hospital; Drs Shnider, Gold, Hunter, and Bersack from Mt Alto Veterans Administration Hospital; Drs Owens, de Leon, and Dickson from Johns Hopkins Hospital; and Drs Brindley, Brace, Frei, Gehan, and Salvin from the National Cancer Institute. Special thanks are extended to Miss Susan Gordon of the Biostatistical Section at the Lemuel Shattuck Hospital for her valuable help.

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1. Chalmers, T. C. Combination of radiotherapy and chemotherapy in the treatment of carcinoma of the lung. (Report of the Eastern Cooperative Group in Solid Tumor Chemotherapy) Cancer Chemo Reports, No. 16, February 1962.

2. Zubrod, C. G., Schneiderman, M., Frei, E., III, Brindley, C., Gold, G. L., Shnider, B., Oviedo, R., Gorman, J., Jones, R. Jr., Jonsson, U., Colsky, J., Chalmers, T., Ferguson, B., Dederick, M., Holland, J., Selawry, O., Regelson, W., Lasagna, L., and Owens, A. H. Jr. Appraisal of methods for the study of chemotherapy of cancer in man; comparative therapeutic trial of nitrogen mustard and triethylene thiophosphoramide. J Chron Dis 11:7, 1960.

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Recent Advances and Concepts About Amebiasis

Quentin M. Geiman Ph D, Professor of Preventive Medicine, Stanford University School of Medicine.

The topic chosen for this presentation expresses its purpose—to bring graduate physicians up to date on diseases or procedures that have either been omitted or inadequately taught in most medical schools; to acquaint them with problems of diagnosis, treatment, and control of amebiasis and other enteric disorders. With the development of chemotherapy, antimalarial compounds, antibiotics, modern insecticides such as DDT, it has been possible not only to control but to eradicate many diseases in tropical areas.

Meager advances have been made, however, in the case of enteric diseases, amebiasis, and malnutrition. Even tuberculosis presents a different problem in the tropics—where a confirmed case may share a dirt-floored, thatched hut with six to sixteen other people—than in a self-sufficient educated family in the San Francisco Bay Area. Measles and whooping cough may have a serious acute course in undernourished children of the tropics. However much the Armed Forces may plan to be self-sufficient in the tropics, they will encounter native populations with different customs, lack of sanitation, rigors of heat and humidity, contaminated water, insect vectors of disease, animal hosts with a potential for transmitting disease, and loci of endemic disease. Familiarization with these hazards is essential for the preservation of the health of personnel.

In dealing with amebiasis, it is easy to forget that one is not concerned with amebic infection alone, nor even with bacillary dysentery; here is a patient with diarrhea, frequent stools containing blood, dysentery. Gastroenteritis, another synonym, can occur anywhere in the intestinal tract. Many infections and toxins can produce this picture, as can food sensitivity, pellagra, sprue, other organic bowel disease, and emotional disorders. Enteric diseases are a major cause of death in many countries; they are, in fact, the major cause in eight South and Central American countries.

By present methods of bacteriologic and parasitologic attack on the diagnosis of gastroenteritis, the pathogen may be found in only 40% to 70% of cases. Concerted study in Puerto Rico by a bacteriologist, a parasitologist, and a virologist showed shigellosis to be responsible for a certain percentage of infections, intestinal parasites for a small percentage, and enteropathogenic coli or viruses for important percentages. A team, then, is often required. Results of teamwork are well exemplified by experience in a Korean POW camp. Within a few months, the number of infected cases rose from 27 to

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* This is the eighth paper from the Tropical Medicine Symposium, USNH Oakland, Calif., March 14 and 15, 1963. The preceding papers were published in the Medical News Letters of 15 November and 6 December 1963. Edited by Captain Arthur J. Draper MC USN, and authorized by the CO of the Hospital, Rear Admiral Cecil L. Andrews MC USN.

2372; the deaths from 7 to 176. It was evident that an epidemic had developed; officers in charge called for help. A team of clinicians, bacteriologists, parasitologists, preventive medicine officers, and sanitary engineers was dispatched to the scene. Within months, the epidemic was brought under control. Charted were the clinical signs and symptoms that went with amebic and bacillary dysenteries, stools per day, character of the stools, type of exudate, incidence and severity of abdominal pain, tenesmus, nausea and vomiting, maximum temperatures, and results of sigmoidoscopic examinations. By contrast, was the instance of a ship which listed 75 cases of infectious hepatitis before a call for help was issued. Knowing when to call for help is a most important duty for the medical officer!

Amebiasis is one of the common enteric diseases; it is of worldwide—not merely tropical—distribution. An insidious infection, it is sometimes difficult to diagnose and to treat. The cystic stages are responsible for the transmission of the disease in fecal-contaminated food and drink. The dosage of fecal contamination determines the numbers of cysts that invade the tissues of the small and large bowel; from each cyst, eight amebiolae invade the intestine. These are the stages grown in culture. Stained specimens from stool preparations show red blood cells because the lesions occur in the bowel wall. Early cysts containing one nucleus develop into the mature form containing four. "Small-race" histolytica constitute a current academic problem; they are like a dwarf or miniature histolytica. Nonpathogenic, they readily respond to treatment. The question of their diagnostic importance and terminology has still not been answered.

Amebic ulcers in the bowel show a characteristic bottle shape; the amebae themselves are to be found in the outer margin of the lesion. An attempt should be made by the sigmoidoscopist to express material for study from any ulcer he may encounter because organisms other than amebae may also be demonstrated in this manner. Early lesions begin in the bottom of a gland of the large bowel, cluster, penetrate, and cause necrosis. From the submucosa, the organisms gain entrance to the portal circulation and, hence, to the liver. From thence, they may extend through the diaphragm into the lungs. Identification of the organism lying within tissue is easy. The bowel lesion may be confused, however, with the much rarer balantidial lesion. Amebic ulcers commonly occur in the cecum; 87% of patients show lesions in this region. The proctoscopist should remember this distribution!

Superimposed bacterial infection is suggested by widespread inflammatory reaction as seen at sigmoidoscopy. In bacillary dysentery, the characteristic lesions are much more superficial than in amebiasis, and are surrounded by much more hyperemia and superficial inflammation. Sigmoidoscopy is not only useful in discovery of the initial lesions of amebiasis, but is a valuable tool in assessment of response to treatment. After treatment has begun, the procedure should be repeated three times at weekly intervals; the progress of healing can be directly observed.

The chief complications of amebic infection include ameboma, or chronic granuloma of the large bowel, liver abscess, and lung abscess

forming by extension from hepatic involvement. Ameboma is extremely hard to diagnose; it may mimic carcinoma or may occur in conjunction with carcinoma. Hence, surgical intervention is commonly necessary. The signs of liver abscess, fever, hepatic enlargement and tenderness, and the use of aspiration for diagnosis are not discussed in detail.

In the diagnosis of amebiasis, the skilled laboratory technician is the physician's best friend. A series of fresh stool specimens should be examined unstained, stained, and by the concentration technic. Direct examinations of fresh specimens lead to discovery of the organisms in 27% of infected patients; stained films, to their demonstration in 39%; and concentration technics, to 59%. Employment of all three technics gives the maximum yield. The concentration technic is good only for finding cysts. Many examinations may be required. In one case studied at Boston City Hospital, the organism was not found until the eighteenth stool had been examined. The organisms, be it noted, are not excreted at a constant rate.

Control of amebic infection involves environmental sanitation, proper personal hygiene, and treatment of cases, both those with acute infection and carriers. Carriers should certainly be treated in areas where there is poor environmental sanitation. Proper disposal of feces is very important, but may constitute quite a problem. Disposal in a desert area is one thing; in areas like Southeast Asia where the water table is at ground level, it is quite another. This is a job for the sanitary engineer. Fly control to prevent contamination of food and water is important but, of course, difficult, particularly in desert areas. Cysts of the organism need frequent superchlorination of water for riddance up to 12 to 18 parts per million. Globaline tablets developed by the U. S. Army in World War II were quite effective. Composed of an organic iron compound—not chlorine—they are effective not only against amebae but against bacteria as well. Off duty, military personnel must exercise rigid eating precautions and practice meticulous personal hygiene.

For treatment, there is as yet no drug available which will give 100% radical cure of amebic infection. As many as eighty different regimens have been tried in South Africa. Formerly, a course of emetine, followed by carbarsone, then by a broad-spectrum antibiotic was recommended. Emetine and chloroquine are, of course, highly effective for liver complications, but they do not produce a high percentage of cures of the intestinal form of infection. Some older compounds, however, are as effective as any currently available. Some act directly upon the parasites; others, upon the associated bacteria. The combination of carbarsone and a broad spectrum antibiotic is the regime most commonly employed at present. Enterovioform is receiving extensive trials. Effective control of shigellosis with this agent was first reported. Similar results were attained against amebiasis. An extremely high relapse rate, however, was noted in the case of both diseases. The drug is prophylactic, not curative. Further studies of populations in tropical areas are definitely in order.

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Clinical Aspects of Asiatic Cholera

CDR Raymond H. Watten MC USN, Director, Clinical Investigation Center, U. S. Naval Hospital, Oakland, Calif.

Dreaded throughout the East, cholera has been estimated to have caused one million deaths during the past 10 years, not only in India and Pakistan where it is endemic, but in Egypt, Manila, and Japan. Cholera is a disease which produces a catastrophic diarrhea with resultant dehydration, acidosis, and potassium depletion. A discussion of cholera necessarily involves the use of superlatives: the numbers who have died of this disease, 66 million in India alone during the past two centuries; the amount of diarrhea, up to 26 liters per day; the amount of intravenous fluid necessary for replacement therapy, up to 126 liters over a 3-day period; all these features call for superlative adjectives.

Although known since ancient times, cholera has assumed pandemic form only with the advent in the 19th century of the industrial revolution and rapid means of travel. It was the first disease in which parenteral fluid replacement was employed (1837). It was the first in which biochemical studies of body fluids were performed (1837), and the first in which acidosis was recognized (1911). Cholera has been responsible for more quarantine regulations than any other disease. The U. S. Navy has participated in study of cholera through its NAMRU-3 during the Egyptian epidemic of 1947, and NAMRU-2 during epidemics in Thailand in 1958 and 1960.

Cholera is a water and food-borne infection; where a good water supply is available it rarely has a chance to develop. In the matter of a carrier-state, much confusion exists. That a person can carry the vibrio more than 3 to 5 days has never been demonstrated. Where the vibrio hides during the winter or between epidemics has not been worked out. The incidence of cholera is interesting. It occurs in conjunction with a pattern of deficiency states, parasitism, anemia, and generally poor health. A middle class European, reasonably healthy, is most unlikely to contract the disease. Therefore, cholera is not likely to pose a threat either to tourists or to military personnel.

Since the cholera organism is limited entirely to the gastrointestinal tract, the disease it produces differs from those seen in infections from salmonellosis, Shigella, or other bacilli. Formerly, the profuse diarrhea in cholera was thought to result from loosening or lysis of gastrointestinal epithelium, that the organism caused denudation of the intestinal tract through the weeping surface of which copious amounts of water and salts would pour. Observations leading to these conclusions, however, were based on postmortem studies. Agonal or postmortem autolysis could not be excluded.

In acute cholera, recent biopsy studies in living patients have shown intact epithelium. The current concept is that the vibrio produces a toxin that inhibits the cellular transport mechanism, particularly the sodium pump. In the healthy individual, vast amounts of water and salts surge in and out of the intestinal tract. The net flux, of course, is a return of these substances

to the body; most people excrete dry stools. In cholera, resorption of these materials is inhibited. It has been postulated that inhibition of active reabsorption of 10% to 20% would result in stool volumes of 15 to 30 liters per day.

Presentation of certain clinical observation made by the NAMRU-2 team during the Bangkok epidemic of 1958 is now in order. Prior to the arrival of this team, the Thais had been giving vast amounts of saline through an old fashioned gum-rubber apparatus. A patient depicted receiving such an infusion showed a commonly observed sign of infection—a sarong soaked in the back. Quantitative methods of study were then devised, one patient a day being selected. Each such patient was provided with an intravenous infusion, a bladder catheter, and a rectal tube.

The greatest problem in cholera is the diagnosis and treatment of dehydration. A typical patient, a woman of 25, showed before treatment with sunken, dull, listless eyes, hollow cheeks, lips pulled back over the teeth, shrinkage of the thenar eminence, and shrunken hands. After treatment, the patient appeared plump and handsome, replacement of 4 liters of fluid having made this difference. Clinical detection of dehydration is not difficult; the condition is obvious. The problem is to quantitate the degree of fluid replacement necessary. The most successful method of assessment in this study was estimation of the plasma protein content by the use of the copper sulphate determination of specific gravity of plasma. The apparatus is portable, easily set up, and readily usable by anyone after a moderate amount of experience.

Plasma rather than whole blood determinations were chosen because many of the patients were anemic. After estimation of specific gravity, an empirical formula could be used to determine the amount of fluid replacement needed (200 ml N/S for each 0.001 increase in specific gravity above 1.025). Comparison by the Evans blue dye method of measuring plasma volume with other methods—including plasma and blood specific gravity, carbon dioxide content of plasma, microhematocrit, and gravimetric determination of plasma electrolytes—showed the best correlation to be with plasma specific gravity. Allowance for insensible water loss in a hot climate with high humidity proved essential. Treatment of acidosis, also, was extremely worthwhile as was replacement of potassium. Use of the method outlined reduced the mortality rate from cholera from 15% in 1958 to 3% in the following year.

Cholera will continue as long as poverty, malnutrition, ignorance, and superstition exist. Immunization does not appear to be the answer to this disease. Until all of the factors responsible for the propagation and control of cholera have been controlled, proper aid in time of epidemic would better be rendered by rushing supplies of intravenous solutions into the infected area than by supplying vaccine.

* * * * * *

Leishmaniasis - with Emphasis upon Recent Epidemiological Findings

Donald Heyneman Ph D, Associate Research Parasitologist, University of California Medical Center.

In leishmaniasis, as in amebiasis, the difference between infection and disease must be emphasized. Leishmaniasis is far more widespread than high mortality figures reported in disease would indicate. It is a complex involving extremely large numbers of factors, not simply an etiologic agent in a given patient. An interaction between sociologic, biologic, and ecologic factors sometimes produces disease; at other times, a protective situation with a low level of disease. Epidemiologic factors in leishmaniasis must include human malnutrition, the presence of wild animal reservoirs and a variety of insect vectors, and sociologic considerations involving infected human beings, such as extreme poverty and tribal habits.

Leishmaniasis embraces a complex of diseases caused by three organisms that cannot be differentiated morphologically. L. donovani, L. tropica, and L. braziliensis. The first is generally considered the agent for kala-azar, visceral leishmaniasis. This can be further subdivided into a number of disease entities. In the Mediterranean basin, infantile leishmaniasis affects mostly the population under 3 years of age, probably producing a high degree of immunity which makes the disease rare in older age groups. The dog is the common reservoir. The adolescent form occurs in India where man himself is the likely reservoir. In South America, a moderate form occurs in which the dog and wild foxes serve as reservoirs. There is a peculiar form of post-kala-azar leishmanoid which occurs only after infection, after treatment. Papular skin eruptions appear perhaps a year later which may contain demonstrable organisms and which are highly resistant to treatment. Such disease is easily transmissible, even mechanically by stable flies. Another variety of leishmaniasis in addition to those noted may be found in Russia.

The cutaneous form caused by L. tropica is known variously as "Oriental sore" or "Aleppo boil." It may be divided into the classical dry type, urban in distribution, chronic, with little ulceration, and the moist type common in Russia, rural, rapidly productive of weeping ulcers with sharp edges. Dogs are susceptible to the first type; direct transmission mechanically may occur in the second, although sand flies cannot be excluded.

American leishmaniasis, caused by L. braziliensis, produces a hideously deforming disease called "espundia" in the Brazilian rain forest. The organisms occupy the nasal spaces, destroying nasal cartilage, the lips, and pharyngeal areas. A more moderate form in the Peruvian mountains is "uta." Among the gum pickers, another form, "chiclero," chronically affects the pinna of the ear.

The vectors in all three families of diseases are sand flies, tiny midges belonging to the genus Phlebotomus. They are voracious blood-suckers of worldwide distribution found wherever there is sufficient moisture. This

condition may be satisfied in cracks in ground or walls or in garbage heaps, the micro-habitat, which are quite specific for the species. There is a close association between the clinical form of the disease produced and capacity of the individual species of fly to transmit it. Each subtype of leishmaniasis is carried by a specific vector.

Leishmania donovani bodies, typically shown in spleen impression smears, are ordinarily intracellular and possess no flagellum. Found in macrophages, they cluster in cytoplasmic spaces within monocytes. A small black dot, the parabasal body, is found near the eccentric nucleus. In the intestinal tract of the sandfly is found the leptomonad form, elongate with a central nucleus. How these form, where they concentrate, and the rate of development determine whether the fly is a suitable vector.

The clinical picture in kala-azar ("black-sickness") is striking. Strengthening of color and brightness around the forehead gives the disease its name. Advanced cases show extreme emaciation. In the Sudan, swelling of the inguinal nodes is observed. Diurnal fever, lassitude, leukopenia, and moderate to extreme anemia occur. The outstanding feature of the disease, however, is splenomegaly. Growing at the rate of one inch a month, the organ may fill the abdominal cavity. Liver enlargement occurs at a slower rate. In summary, proliferation of L. donovani in the reticulo-endothelial system, primarily in the spleen, causes enormous proliferation of splenic tissue; the liver is involved to a lesser degree. Any organ in the body except the central nervous system may, however, be affected.

A characteristically violent outbreak of kala-azar occurred in the Sudan in 1952. Of 18,000 people estimated to have been infected, some ten thousand died. Whole villages were wiped out. Inhabitants of others took to flight. Witch doctors refused to treat the victims. Representatives of the World Health Organization, invited by the Sudanese government to survey the area, recommended intensive research, especially with respect to transmission of the disease and to epidemiologic factors involved. A special leishmania project under the aegis of NAMRU-3 resulted. The project was aimed at finding a vector, an animal reservoir, and a mode of transmission; none of these objectives had been achieved, despite intensive effort, during the preceding half century.

First, an effective survey of the sandfly population was achieved by catching flies on deliberately exposed people, grinding them up, and inoculating them aseptically into hamsters. The hamsters became sick and died of leishmaniasis. The organism was carried in culture. One fly, Phlebotomus orientalis, of the forty-two species in the Sudan, was found to be infected. The vector common in the Mediterranean was present but not infected.

Spleen impressions from livers of three kinds of infected rats contained leishmania which "took" in hamsters. Rodentine reservoirs appeared to be potential sources of epidemics. Phlebotomus orientalis epidemics occur every 6 or 7 years due to fluctuations of rat populations, concentration of sandflies, and proximity to human beings. Since man harbors the organism in the nasal mucosa and excretes it in urine and feces, possibility of direct transmission as in pneumonic plague must be considered.

MISCELLANY

BUMED NOTICE 6310 19 November 1963

From: Chief, Bureau of Medicine and Surgery
To: Convening Authorities of Medical Boards and Boards of Medical Survey

Subj: Reports of Boards of Medical Survey and Medical Boards; recording of disease and injury codes

Ref: (a) Department of Defense Disease and Injury Codes (NAVMED P-5082)
(b) Standard Nomenclature of Diseases and Operations (SND)
(c) Joint Armed Forces Statistical Classification and Basic Diagnostic Nomenclature of Diseases and Injuries With a List of Surgical Operations (NAVMED P-1294)
(d) BUMEDINST 6310.5, Subj: Implementation of Department of Defense Disease and Injury Codes (DDDIC)

1. Purpose. To direct activities submitting Reports of Boards of Medical Survey and Reports of Medical Boards to use diagnoses and code numbers from the Department of Defense Disease and Injury Codes.

2. Background. The Bureau has noted that many of the subject reports fail to show diagnoses in nomenclature of references (a) or (b) with corresponding code numbers from reference (a). This results in considerable, unnecessary expenditure of time and effort on the part of Bureau personnel in researching and assigning code numbers.

3. Action. Addressees are directed to insure that the subject reports set forth the diagnoses and code numbers in terms of reference (a). Nomenclature and code numbers drawn from reference (c) shall not be used, as directed by reference (d).

4. Cancellation. This Notice is canceled upon noting the contents thereof, and no later than 31 January 1964.

E. C. KENNEY

Additional copies of this directive may be obtained from:
Bureau of Medicine and Surgery, Code 4522.

Immunization Information for International Travel - 1963-1964 Edition

The booklet, Immunization Information for International Travel, revised in June 1963, has been published. Previous issues of the booklet and any addendums should be destroyed.

Changes in immunization requirements occurring before the next issue of the booklet will continue to be listed under the item, International Notes - Quarantine Measures, in the weekly Morbidity and Mortality Report, published by the Communicable Disease Center, Atlanta 22, Ga. Persons not receiving this report may write to that office to be placed on the mailing list. Copies of the booklet may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C. 20402, at 35¢ a copy. There is a discount of 25% for 100 or more copies delivered to the same address.

The principal revisions are included in Section 5 which contains the most current information on the immunization requirements for entrance to countries. New yellow fever vaccination centers to which the public may be referred have been added to Section 6. —DHEW PHS.

* * * * * *

International Certificates of Vaccination

Reports have been received by the Division of Foreign Quarantine of the U. S. Public Health Service that many persons traveling abroad have their immunizations recorded either on a physician's prescription blank or have the international vaccination document improperly completed. Consequently, in some instances, these travelers are being detained at international ports of entry.

International travelers should be warned that smallpox and cholera vaccinations, when required for international travel, must be recorded on the World Health Organization approved International Certificates of Vaccination Form; all information must be complete including the "Approved Stamp," which is the stamp of the local or State Health Department. Other approved stamps include those of the Department of Defense, Public Health Service, and those special stamps issued by the latter agency.

—M & M Wkly Rep DHEW PHS 12(45): 384, 15 November 1963.

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Drug Literature Report. The Senate Committee on Government Operations has published the report on the Nature and Magnitude of the Drug Literature which the National Library of Medicine prepared at the request of the Subcommittee on Reorganization and International Organizations. This Committee Print is entitled Drug Literature; copies are available at 65¢ from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402. —National Library of Medicine News, DHEW PHS.

Trachoma Virus Actually a Bacterium

Scientists at the Naval Medical Research Institute, Bethesda, report in the November 22 issue of Science that trachoma "virus" utilizes glucose, a sugar. This is a property common to almost all bacteria but not to viruses. Bacteria produce their own energy and manufacture their own cell substance. Glucose is the most common source of energy for man as well as bacteria. Viruses, on the other hand, "direct" the cells of the host in which they grow to do this work for them.

Although the microorganism causing trachoma is found within host cells, it is now apparent that this disease agent possesses the attributes of a bacterium rather than a virus. Although the agent of trachoma has not yet been grown without host cells, the present finding is believed to be the first important step in that direction. Growing the agent of trachoma in a chemical medium without cells would greatly aid diagnostic procedures and improve the production of vaccines.

Two scientists of NMRI are responsible for this work. They are Richard Ormsbee, guest scientist from the National Institutes of Health in Hamilton, Montana, and Emilio Weiss, Deputy Director of the Department of Microbiology of NMRI. Both men are known for other work on the properties of microorganisms that lie at the border line between viruses and bacteria. This is their first major venture in the field of trachoma.

Trachoma is a disease of the eye that often blinds its victims. It is estimated that it affects 400 million persons, mostly in tropical zones of the world. The agent of trachoma was cultivated in the cells of developing chicken embryo for the first time in 1955. Since then, scientists throughout the world have isolated strains and produced and tested vaccines. The U. S. Navy has taken the lead in this investigation at both the Naval Medical Research Unit No. 2 in Taipei, Taiwan, and the Naval Medical Research Institute in Bethesda, Md. —NMRI NNMC, Bethesda, Md.

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Missile Emergency Teams Formed

Point Arguello, Calif., NAVNEWS, 15 November 1963. Missile Accident Emergency Teams (MAETs) to assist in event of missile fires, explosions, or missile impacts have been formed at the Naval Missile Facility here. MAET teams will stand by during fueling, defueling, ordnance installations, static firings, and missile launches at NMF.

The teams were established by the Range Department under the Range Officer and, during missile operations, the MAET is under operational control of the Ground Safety Officer.

Although the MAET composition varies with the types of operation being supported, a typical team might consist of the units as listed on the following page:

One MAET Commander with radio-controlled vehicle
One Pad Safety Officer
Two four-man fire companies with fire trucks
Two sentries with vehicles
Two corpsmen with ambulances
One heavy equipment operator with a bulldozer on a truck
One 10-man fire fighting team of Navy enlisted men with a 4-wheel drive truck
One photographer with equipment
Two helicopters and crews
One explosive ordnance team with vehicle

When the MAET team assembles, some come dressed in strange costumes. The hospital corpsmen and firefighters wear rubber acid suits to protect them from noxious vapors and fluids. Special oxygen breathing apparatus is used with the acid suits.

MAET teams on the scene could cut off a danger area, put out fires, treat personnel, properly dispose of explosives, evacuate personnel, vent high pressure vessels, maintain security, maintain communications, and provide documentary photography during any emergency.

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How Indianapolis Hospitals Met the Blast Emergency

Shortly after 11:00 p.m., October 31, 1963, a gas explosion ripped the Coliseum and flooded Indianapolis hospitals with 385 blast victims, many of them suffering from shock and multiple injuries. Indianapolis hospitals have met emergency demands on their resources before, but this catastrophe was the first real test of their total resources. All of the local hospitals, the city agreed, performed magnificently in handling the emergency.

At a post-disaster critique held 5 days after the explosion, hospital representatives said that their hospitals were not officially notified of the disaster before patients began arriving. Telephone lines soon became so clogged with calls for information that they were useless for communication between hospitals and disaster agencies. State and local police radios became the major means of communication, but these were not available to hospitals.

Among the consequences of lack of adequate communication were the following: (1) Hospitals were not notified promptly of the disaster, so were harder pressed to cope with patients than they otherwise would have been. (2) Proper distribution of patients could not be made because rescue workers and physicians at the Coliseum could not communicate with hospitals concerning how many blast victims they could accept. (3) Hospitals could not learn the extent of the disaster so did not know whether to launch a full-scale disaster effort including recalling staff and personnel from home. (Hospitals, J Amer Hosp Assn, November 16, 1963) From: Civil Defense Review, Council on National Security, AMA 13(6):7, December 1963.

FROM THE NOTE BOOK

International Naval Medical Conference

The Second Conference of the Surgeons General, Navies of the Americas, and the First Mexican Congress of Naval Medicine were held recently in Mexico City. Represented were the navies of Argentina, Brazil, Canada, Colombia, Chile, Ecuador, United States of America, Guatemala, Mexico, Paraguay, Peru, Uruguay, and Venezuela. Scientific program participants from the U. S. Navy included RADM E. C. Kenney MC USN, Surgeon General; RADM R. B. Brown MC USN, Assistant Chief of Bureau for Personnel and Professional Operations; CAPT R. E. Mitchell MC USN, Research Assistant for Cardiology, U. S. Naval School of Aviation Medicine, NAMC, Pensacola, Fla.; CAPT H. G. Green DC USN, Head of Oral Surgery Department, U. S. Naval Dental School, NNMC, Bethesda, Md.; CDR J. H. Schulte MC USN, Director, Submarine Medicine and Special Weapons Defense Divisions, BuMed; CDR E. W. Bird MC USN, Head of Audiovisual Training Branch, BuMed; and CDR J. E. Rasmussen MSC USN, Acting Director, Behavioral Sciences Department, Naval Medical Research Institute, NNMC, and Head of Research Coordination Section, Neuropsychiatry Branch, BuMed.

The Conference was sponsored by the President of the Republic of Mexico, Adolfo Lopez Mateos; the Secretary of the Mexican Navy, C. Almirante C. G. Manuel Zermeno Araico; and the Surgeon General of the Mexican Navy, Contralmirante S. N. M. C., Rafael Vargas Salazar. This jointly conducted conference was a great success. Members of the United States delegation found the assemblies of leaders in naval medicine of the Americas to be mutually beneficial and rewarding for the exchange of ideas, revelation of areas and methods for management improvement in administration, and for promotion of modern methods of preventive medicine and patient care in military populations. The agenda was skillfully planned as were the several excellent programs of social recreation during the week of the conference.

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NAMRU No. 2 - Its Historical Background and 1963 Reunion

The NAMRU idea was fostered by the late Vice Admiral Ross T. McIntire in 1942. He requested that Doctor Thomas M. Rivers, then Director of the Rockefeller Institute's Department of the Hospital, take leave of absence from his post to inspect the Southwest Pacific Area for the Navy in order to determine the number of casualties resulting from tropical diseases.

Upon his return, Doctor Rivers reported that "malaria and other tropical diseases were causing as many Pacific casualties as were bullets." Early in 1943, he organized Naval Medical Research Unit No. 2 with the purpose of combating the little known tropical diseases by research methods.

The unit numbered fewer than three hundred officers and enlisted men. The site chosen for this field medical research laboratory—the first of its kind in world military history—was Guam. Arriving at this Pacific island late in 1944, the handpicked group of personnel "cleared the area, built, and maintained (for several years) an efficient field laboratory." Trained teams accompanied many invasion units throughout the Pacific Area and returned to their Base on Guam for technical evaluation and development of their findings.

Following the years of World War II, many of the original personnel communicated with one another. In March 1962, through the efforts of Doctor Robert H. Jackson and P. Bruce Brockway Jr, a questionnaire was sent to known former members of the Navy-Rockefeller Unit concerning advisability of holding a reunion. The replies were enthusiastic. After months of intensive planning, the first Reunion of NAMRU No. 2 was held 25 - 26 October 1963 in Washington, D. C. Many returning former members of the unit, their wives and guests, the Medical Department of the United States Navy, Members of Congress, and others contributed greatly to the success of the 1963 Reunion.

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New Billet for Research and Development. CAPT Carl E. Pruett MC USN, who has been on loan for the past year to the Director of Defense Research and Engineering as a staff specialist in Medical and Biological Sciences, has returned to the Navy. On 15 October 1963, he assumed duties as Assistant for Medical and Allied Sciences, to the Deputy Chief of Naval Operations (Development). This position has been established as part of the Navy plan to give more consideration to problems of Man in the Weapon System during Research and Development Phases.

Field Tests of New Antimalarial Drug. Field testing of the new long-acting antimalarial drug, C1501, will begin in Pakistan probably early in 1964. On a recent visit to Pakistan, Dr. G. Robert Coatney, Chief of the Laboratory of Parasite Chemotherapy, National Institute of Allergy and Infectious Diseases, completed testing arrangements with Dr. M. K. Afridi, Consultant on malaria to the Pakistani government. They were assisted by representatives of University of Maryland's International Center for Medical Research and Training with facilities at Lahore, Pakistan. The field trial will extend over approximately a period of 30 months.

A single injection of the new drug continued to protect volunteers nearly a year later even though they were bitten by heavily infected mosquitoes at monthly intervals according to initial results of testing reported by Dr. Coatney at the annual meeting of the American Society of Tropical Medicine and Hygiene in November 1962. Volunteers not given the drug who were bitten by the same mosquitoes "invariably came down with malaria."

—Public Health Report, DHEW PHS 78(11):976, November 1963

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Naval Medical Research Reports

U. S. Naval Medical Research Unit No. 3 Malakal Subunit, Cairo, Egypt

1. Leishmaniasis in the Sudan Republic. 15. An Outbreak of Kala Azar in the Khor Falus Area, Upper Nile Province: MR 005. 09-1603. 1, October 1963.
2. Ecological Studies of Phlebotomus Sandflies in the Paloich Area, Upper Nile Province, Sudan: MR 005. 09-1605, October 1963.

U. S. Naval Medical Research Unit No. 4, U. S. Naval Training Center, Great Lakes, Ill.

1. Comparative Effectiveness of 1/2 ml and 1 ml Doses of Adenovirus Vaccine on Respiratory Disease in Navy Recruits: MR 005. 09-1203. 1, September 1963.

U. S. Naval Air Development Center, Aviation Medical Acceleration Laboratory, Johnsville, Penna.

1. Eye Melanin Free Radical Kinetics and Mechanism in Relation to the Roginsky-Zeldovich (or Elovich) Equation and the Adsorption of Oxygen by Semiconductors: MR 005. 13-0002. 7 Report No. 23, September 1963.
2. Pilot Biomedical and Psychological Instrumentation for Monitoring Performance During Centrifuge Simulations of Space Flight: MR 005. 13-6002. 4 Report No. 3, October 1963.
3. The Composition of Mitochrome and Cytochrome Oxidase from Rat Liver Mitochondria: MR 005. 13-0002. 7 Report No. 22, October 1963.

U. S. Naval Medical Field Research Laboratory, Camp Lejeune, N. C.

1. Effect of Postburn Serum on In Vitro Respiration of Normal Myocardium: MR 005. 12-7020. 1. 4, September 1963.
2. Early Changes in Serum Enzymes in the Rat Following Burn Trauma: MR 005. 12-7020. 1. 5, September 1963.
3. Influence of Body Armor Coverage and Weight on Performance of the Marine while Performing Certain Simulated Combat-Type Tasks: MR 005. 12-7010. 1. 17, November 1963.

U. S. Naval Submarine Base, U. S. Naval Medical Research Laboratory, New London, Conn.

1. Difference Between Real and Apparent Visual Movement: MR 005. 14-1001-1. 30 Report No. 402, May 1963.
2. Lighting Survey of USS SEA ROBIN (SS407) Memorandum Report No. 63-9: MR 005. 14-1100-1. 13, June 1963.
3. Submarine Psychiatry: MR 005. 14-2100-1. 12 Report No. 409, August 1963.
4. Lighting Survey of USS SUNBIRD (ASR-15): MR 005. 14-1100-1. 14 Memorandum Report No. 63-11, August 1963.
5. Relation of Perstimulatory Adaptation to Other Short-Term Threshold-Shifting Mechanisms: MR 005. 14-1001-2. 13 Report No. 407, August '63.

DENTAL SECTION

Diagnosis and Prevention of Cerebrovascular Accidents

Ben Eiseman MD, Frank Spencer MD, and Stephen F. Dachi DMD MSD, University of Kentucky, Lexington, Kentucky. Oral Surgery, Oral Medicine, and Oral Pathology 16(10): 1174-1179, October 1963.

This report, by faculty members of the University of Kentucky, Colleges of Medicine and Dentistry, brings attention to a symptom often observable first in the dental office, which may precede cerebrovascular accidents.

During dental examination and treatment, it frequently becomes necessary to rotate the patient's head far to one side for adequate exposure. Occasionally such rotation produces temporary neurologic signs, such as confusion, dizziness, blurring of vision, slurred speech, and unconsciousness. Any patient with such symptoms should be referred for medical consultation, since additional tests are required to determine if these, as observed by the dentist, are indicative of brain hypoxia. If so, is this a result of diminished blood flow through a diseased carotid artery that has become compressed by rotation of the head.

Attention of Medical News Letter readers is invited to the original article to become familiar with the symptoms, physiology involved, and the possibility of success in treatment when diagnosed early.

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Current Evaluation of Fluoride Therapy*

J. C. Muhler, School of Dentistry, Indiana University. J Am Pharm A 3: 133-135, March 1963. From Dental Abstracts 8(10): 608-609, October 1963.

The uncontrolled dissemination of fluorides is a cause for increasing concern for the Food and Drug Administration and dental scientists. Currently, three methods of using fluorides are considered safe by most dental scientists. These are: (1) fluoridation of the public water supply; (2) topical application; and (3) a stannous fluoride-calcium pyrophosphate dentifrice.

Other methods of application, such as vitamin supplements and prenatal products, should be discouraged until conclusive proof is provided of their benefits and possible harmful effects.

Effect of Orally Administered Neomycin* on Absorption of Penicillin V

Samuel H. Cheng and Arthur White, University of Louisville School of Medicine, Louisville, Kentucky. JAMA 267: 1296-1297, December 20, 1962. From Dental Abstracts 8(8): 505, August 1963.

Studies of the absorption of penicillin V (potassium phenoxymethyl penicillin) were performed on five normal, healthy young male medical students before, during, and after the daily oral administration of 12 Gm of neomycin (in the dose of 3.0 Gm four times a day). Penicillin activity in urine and blood was assayed by a cylinder-plate method using Sarcina lutea as the assay organism.

The oral administration of neomycin reduced serum penicillin concentration and urinary recovery of penicillin to less than 50 per cent of control values. A return toward normal values was apparent six days after the administration of neomycin was discontinued.

The absorption of penicillin V is so reduced during the oral administration of neomycin that the therapeutic efficacy of the penicillin may be severely compromised.

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Personnel and Professional Notes

National Children's Dental Health Week. All Dental Officers and Technicians are encouraged to participate in the forthcoming National Children's Dental Health Week. Many facilities already have excellent annual programs designed to work with dependents, community school systems and PTA groups. They have set a good pattern for all to follow.

The preventive dentistry film Oral Hygiene MN 8952, supplemented with locally made posters, is a valuable aid to those personnel selected to present talks to children and/or parents. Additional material may be procured from the Bureau of Dental Health Education, ADA, 222 East Superior Street, Chicago, Illinois, 60611. Many of the drug and toothpaste manufacturers have national programs planned to assist dental societies and dentists in preventive dentistry. For the address of your local representative for programs distributed by such companies, contact the Professional Services Division, P.O. Box 599, Cincinnati, Ohio.

As successful programs are organized please inform the Dental Division, Bureau of Medicine and Surgery, so appropriate recognition may be made and service-wide distribution of ideas accomplished. In this way the Dental Division can perform effectively as a distribution center to help all personnel to improve their preventive dentistry efforts.

Preventive Dentistry Course Held at Naval Dental School. Dental officers of the Army, Navy, Air Force, Public Health Service, and Veteran's Administration, along with 18 Commanding Officers of Naval Reserve Dental Companies, attended a course on "Preventive Dentistry" at the Naval Dental School, Bethesda, Maryland. The five day course, which commenced on 28 October 1963, emphasized prevention of the two most common oral pathological problems, dental caries and periodontal disease by recognition and elimination of contributing factors. The dental health of military personnel along with the means and personnel available to treat clinically evident cases was discussed as an important approach to a practical application of preventive dentistry today, and in the future.

Representatives of the military, university, and public health institutions conducted the course, which included: Dr. Basil G. Bibby, Eastman Dental Dispensary; Dr. Philip Jay, University of Michigan; Dr. Joseph C. Muhler, Indiana University; Dr. Harry W. Bruce, U. S. Public Health Service; Drs. Norman Littleton, Paul Baer, David Scott, Paul Keyes, Edward Hampp and Robert Fitzgerald of the National Institutes of Health; COL George Burnett DC USA and COL Russel Sumnicht DC USA: CAPT Angus W. Grant DC USN, CAPT Theodore R. Hunley DC USN, CAPT Peter F. Fedi DC USN, and CAPT Frank Grossman DC USN, of the Naval Dental School. The Director of the course was CAPT Gordon H. Rovelstad DC USN. CAPT Arthur R. Frechette DC USN is Commanding Officer of the Naval Dental School.

Dental Reserve Officers Attend BUMED Seminar. Eighteen Dental Reserve Officers from the Third, Fourth, Fifth, Sixth, Eighth, and Ninth Naval Districts attended a seminar conducted by the Dental Division, Bureau of Medicine and Surgery, 28 October to 1 November 1963. The seminar, which was conducted at BUMED with field trips to the Naval Dental School and the Bureau of Naval Personnel, was designed to acquaint commanding, executive, and training officers with the administrative and technical considerations of dental reserve companies. A similar course will be presented for Dental Reserve Officers of West Coast Naval Districts, 7-9 September 1964.

List of Officers Attending
Dental Reserve Commanding Officers' Seminar

CAPT Evert A. Archer DC USNR, Lake Bluff, Illinois
LT George R. Butler Jr. DC USNR, Atlanta, Georgia
LCDR Ferdinand C. Cerine DC USNR, Springfield, Va.
CDR Loren W. Curtis DC USNR, Peoria, Illinois
LT Frederic Custer DC USNR, Philadelphia, Pennsylvania
LT Ted E. Dyer DC USNR, Liberty, Missouri
LCDR Albert O. Grant DC USNR, Morristown, New Jersey
LCDR John R. Gunderson DC USNR, Homestead, Florida
CDR Joseph W. Johnson Jr. DC USNR, Waukee, Iowa
CDR Andrew M. Linz DC USNR, New York, New York

CAPT Jack E. Myers DC USNR, Dallas, Texas
CDR Albert G. Paulsen DC USNR, Falls Church, Va.
CDR William C. Perkins DC USNR, Dallas, Texas
CAPT Lowery D. Reaves DC USNR, Dearborn, Michigan
CAPT Robert B. Smythe DC USNR, New Orleans, Louisiana
LT James M. Sweeney DC USNR, Shawnee, Kansas
CAPT Robert W. Wiethoff DC USNR, Wayasta, Minnesota
CDR Nathan R. Callaghan, Jr. DC USNR, Iowa City, Iowa

Joint Training Program. The dental officers at the Naval Air Station, Atsugi, Japan and Army dental officers at Camp Zama, Japan have scheduled bi-monthly training programs. The first program was presented at Atsugi, on 9 December 1963 and CAPT Juda DC USAF, Orthodontist at Fuchu Air Station, presented a paper on the topic "Orthodontists as Related to the General Practitioner."

These combined programs are included in the weekly training schedule routinely presented at Atsugi, under the direction of the dental department training officer LCDR T. E. Stump DC USN. CAPT Norman B. Shipley DC USN, is head of the Dental Department, NAS, Atsugi, Japan.

Annual Session of Military Surgeons. Dental officers participated in the 70th Annual Meeting of the Association of Military Surgeons, 4-6 November 1963, which was devoted to the theme, "Medical Research Today-Military Resource Tomorrow." CAPT William E. Ludwick presented a report on "Increased Use of Specially Trained Dental Technicians." CAPT William R. Stanmeyer analysed the "Educational Trends and Problems in the Federal Dental Services." CAPT Carl A. Ostrom served as Chairman of the Dental Section.

Preventive Dentistry in Iceland. The following article appeared as one of a series presented by the station newspaper in cooperation with the Dental Department at the U. S. Naval Station, Keflavik International Airport. This series of preventive dentistry articles is one phase of their outstanding program to help improve the oral health of the personnel in that area. CAPT George R. Reynolds DC USN is the head of the Dental Department:

How's your dental IQ? If it is high, chances are your dental problems are few and you will keep your teeth for a lifetime. If low, you ought to see your family dentist for the care and instruction he can give which will remedy the situation. Test yourself and see how you do. Decide which of these items are fact and which are fable.

1. Pregnancy increases tooth decay.
2. Teeth decay because they are soft.
3. The six-year molar is the last of the baby teeth.
4. The best times to brush your teeth are before breakfast and before going to bed.
5. Drinking lots of milk will help prevent tooth decay.
6. A decayed tooth will sometimes heal itself.

7. Some toothpastes can prevent all tooth decay.
8. Cutting down on sweets helps prevent tooth decay.
9. Fluoridation of public water supplies is the best way of preventing tooth decay for large groups of people.

Of these statements, the first seven are fables, the last two are fact. Here's why the first aren't true:

1. If tooth decay increases during pregnancy, it is probably because of poor mouth hygiene or more eating of sweets rather than direct cause and effect relationship.
2. Teeth vary little in hardness, and the slight difference has nothing to do with decay.
3. "Six year" molars are permanent teeth.
4. Brushing is most effective immediately after eating. Decay starts within 15 minutes.
5. Milk is a good food, but its main dental value is in building teeth before they erupt. It will not prevent decay in teeth already erupted.
6. A decayed tooth can only get worse, unless it is treated by your family dentist.
7. No toothpaste by itself can prevent all decay. However, there is one stannous fluoride toothpaste now marketed which has been recognized by the American Dental Association as effective against decay when used as part of an overall program of oral hygiene, proper diet, proper brushing, and regular visits to the dentist.

Dental Service Report, DD Form 477-1. All responsible dental officers at each separate command are reminded that the Dental Service Report, DD Form 477-1 (Equipment and Facilities Supplement) shall be submitted on 1 January of each year. The original shall be addressed to BUMED, one copy to the Field Branch BUMED, 3rd Avenue and 29th Street, Brooklyn 32, N. Y., and one copy to the reviewing officer. In accordance with Advance Change 14-1, Manual of the Medical Department, line 9 of this report should indicate air turbines as separate equipment items regardless of whether they are attached to and accounted for as part of the operating unit.

Naval Reserve Dental Company 3-2. The appointment of CAPT Daniel F. Tobin as the new Dean of the Seton Hall School of Dentistry recently prompted an analysis of the professional accomplishments of the members of the Naval Reserve Dental Company 3-2. The Company is made up of 37 officers. Six of these officers are Fellows of the American College of Dentists; four are Diplomates of American Boards, two in Orthodontia, one in Prosthodontia, and one in Oral Surgery. Ten members belong to specialized dental organizations such as the American Society of Oral Surgeons and the Northeastern Orthodontia Society; twelve are Fellows of the New York Academy of Dentistry, including the current president, CDR Robert W. Northrop.

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OCCUPATIONAL MEDICINE

Acute Chlorobromomethane Toxicity

CAPT Harvey R. Rutstein MC USAF, Department of Surgery, Mount Sinai Hospital, N. Y. Archives of Environmental Health 7(4): 440-444, October 1963.

During World War II carbon tetrachloride and methyl bromide were widely used by both the Allied and German armed forces as fire-extinguishing agents. These chemicals are highly toxic. When heated to decomposition carbon tetrachloride emits the fumes of hydrogen chloride, chlorine, and phosgene. Methyl bromide decomposes into various toxic halide compounds. The risk of phosgene poisoning from carbon tetrachloride decomposition was subsequently proved overestimated; however, carbon tetrachloride remains a potentially hepatotoxic and nephrotoxic chemical to those suffering from severe exposures to it. Methyl bromide is no longer used as a fire-extinguishing agent in this country.

Toward the end of the war, German scientists introduced chlorobromomethane ("C B") into the military armamentarium as an effective, "less toxic" vaporizing liquid fire-extinguishing agent. After the war had ended, Allied scientific authorities reinvestigated this chemical and analyzed the results of the German experience with it. They found chlorobromomethane to be more effective than carbon tetrachloride and less toxic than methyl bromide. It was adopted as the secondary agent on all water-foam aircraft fire-fighting apparatus as an adjunct to the action of the primary agent, mechanical protein foam.

The problem of chlorobromomethane toxicity has received recent investigative attention because of animal exposure studies which have defined the toxic potential of the chemical. This fire-fighting agent may eventually be replaced by a less toxic substance after further pyrolysis investigation of such compounds as dibromodifluoromethane, bromochlorodifluoromethane, and 1, 2-dibromotetrafluoroethane.

Chlorobromomethane toxicity is rare. Ingestion of the chemical has not been reported, and it cannot cause toxicity by skin penetration, although bothersome dermatitides have followed prolonged skin contact exposures. Toxicity is noticeable after inhalation of concentrated vapors of the chemical. Since chlorobromomethane is usually handled in open spaces by those well indoctrinated in its toxicity potential, there have been relatively few acute poisonings. Reports of these poisonings have been confined to the European literature.

The following cases illustrate the syndrome of "acute chlorobromomethane toxicity" as witnessed in three previously healthy men who were exposed to concentrated vapors of the decomposing chemical for short periods of time.

Case 1. A 21-year old member of the Pease Air Force Base fire-fighting department was summoned at 4:15 p. m. to the scene of an emergency landing of a B-47 jet bomber. The aircraft had developed a fuel leakage, and high-octane fuel was dripping on the nose landing-gear apparatus. It was feared that as the pilot braked the plane, the gear mechanism would overheat and ignite the dripping fuel.

As the aircraft touched the runway the pilot applied his brakes, and the bomber came to a grinding halt. The patient approached the plane and began to concentrate a steady stream of chlorobromomethane over the hot metal. He stationed himself approximately five feet from point of contact of chemical with metal. After five minutes in this position, his associates noticed he was swaying back and forth, obviously disoriented. They removed him from the scene and summoned an ambulance. The patient was taken to the Base Dispensary Emergency Room. During the ambulance ride he lost consciousness.

Upon his admission at 5 p. m. the vital signs were normal. The patient had regained consciousness, but he was drowsy and disoriented. He complained of a pounding bitemporal headache, nausea, and stomach cramps. The tips of his fingers were numb and cold. He was unable to remember where he had been or why. Physical examination was within normal limits except for hyperemia of the nasal and pharyngeal mucosae and conjunctival injection. He could not maintain his balance. At 5:15 p. m., while being observed, he lapsed into unconsciousness and became apneic.

The patient was placed in a supine position, and a mechanical airway was inserted. Oxygen was started by mask. Manual artificial respiration was quickly instituted. The patient received an injection of 250 mg of caffeine and sodium benzoate intravenously and 250 mg of the drug intramuscularly.

After one hour with the above vigorous therapy, the patient began to breathe spontaneously, but the respirations were weak. He was given another 500 mg of caffeine and sodium benzoate by intravenous injection, but within five minutes he again was apneic. By sniffing near the patient's mouth, one could smell the sweet, acrid vapors of chlorobromomethane and its decomposed constituents being expired. The artificial respiration was intensified. Generalized muscular twitchings were noticed. Occasional lip cyanosis responded to an increased oxygen supply.

At 7:45 p. m. the patient again began to breathe spontaneously. He regained consciousness, but he was very drowsy and still disoriented. His blood pressure, pulse, and temperature were normal. After several minutes of observation it was decided that he could be transferred for admission to a nearby hospital.

At 9 p. m., while lying in a hospital bed, the patient complained of a throbbing bitemporal headache. He had become sufficiently oriented to answer questions. Physical examination was within normal limits. The blood pressure

was 100 systolic, 70 diastolic, the pulse was 76 and regular, the temperature 98.4°F (36.9C), and the respirations 16. Examination of the blood revealed a hemoglobin of 15 gm per 100 ml; the white cell count was 9,500 with 75% neutrophils and 25% lymphocytes. The urine was normal. The urea notrogen was 20 mg, the cholestrol 150 mg, the bilirubin (total) 0.4 mg, and the total protein 7.8 gm (the albumin 5.5 gm, and the globulin 2.3 gm) per 100 ml. The transaminase was 44 units, and the alkaline phosphatase 6 Bodansky units. The prothrombin content was 100%. The cephalin flocculation, thymol turbidity, and sulfobromophthalein retention were normal. A chest x-ray was normal.

During the first 24 hours the patient remained drowsy, and it was difficult to rouse him from sleep. Generalized muscular twitchings, resembling fasciculations, were prevalent, but the neurologic examination was within normal limits.

After one week of hospitalization the patient complained only of anorexia and lethargy. He had lost four pounds in spite of a nourishing diet. The muscular twitchings and mental turbidity had cleared after 48 hours. Because one observer thought the liver edge palpable one fingerbreadth beneath the right costal margin, a Vim-Silverman needle biopsy was performed. It revealed normal hepatocellular configuration without evidence of toxic change. The patient was discharged on the 14th hospital day fully fit for military duty.

Case 2. A 21-year old firefighter was called to the emergency scene with the patient in Case 1. He positioned himself approximately eight feet from point of contact of chemical with metal. He began to spray mechanical protein foam and water over the chlorobromomethane to prevent "flashback" of fire which is common because of the rapid evaporation of chlorobromomethane.

This patient soon noticed a sweetish, pungent odor which was cold on inhalation and seemed to take his breath away. His arms and legs began to feel cold and numb. Dizziness ensued, but he remained aware of his environment. His eyes began to smart, and his upper respiratory tract mucosae burned from the toxic vapors. Mild cephalgia in both temporal regions was noticed. He removed himself from the scene and accompanied patient 1 to the Emergency Room. Twenty minutes thereafter he began to complain of nausea, a burning sensation in his stomach, and a pounding headache bitemporally.

At 5:30 p.m., after 30 minutes of unrevealing examination, he fell unconscious. There immediately ensued generalized muscular twitchings and shaking movements of all extremities to the extent that physical restraint of the patient by two corpsmen was required. Oxygen was started by mask for fear of respiratory depression, but his respirations remained spontaneous and unlabored. Vital signs were normal. He remained unconscious and convulsing for two hours in spite of the intravenous injection of 200 mg of diphenylhydantoin and 300 mg of sodium phenobarbital. To negate any respiratory depressant effect of sodium phenobarbital he was given 500 mg of caffeine and sodium benzoate by intravenous injection and 500 mg of the drug intramuscularly. At 7:30 p.m. he regained consciousness. He was weak and disoriented. The convulsive movements had abated, and he was deemed fit for transfer to a nearby hospital. Respirations had remained good, and his lungs were clear to auscultation.

On his admission the temperature was 98.6°F (37.0 C), the pulse 88, and the respiration 16. The blood pressure was 140 systolic, 88 diastolic. Examination of the blood revealed a hemoglobin of 15.5 gm per 100 ml and a white cell count of 10,500 with 75% neutrophils, 23% lymphocytes, and 2% eosinophils. The urine was normal. The urea nitrogen was 18 mg, the total bilirubin 0.8 mg, and the total protein 7.6 gm (albumin 5.5 gm, and globulin 2.1 gm) per 100 ml. The alkaline phosphatase was 3 Bodansky units, the cephalin flocculation, thymol turbidity and urobilinogen were normal. A chest x-ray was normal.

A Vim-Silverman needle biopsy performed on the eighth hospital day to rule out liver cell damage revealed normal hepatic microanatomy. Repeat urine and liver function studies were within normal limits, and the patient was discharged to duty on the 14th hospital day.

Four weeks after exposure to chlorobromomethane vapors the patient complained of a sharp, intermittent left precordial pain for which no etiology could be elucidated. An electrocardiogram and chest x-ray were within normal limits. He complained of continuing anorexia and lethargy, and he had lost 14 pounds since exposure in spite of an adequate food intake. Eight weeks after exposure all lost weight had been regained. The only complaint at this time was easy fatiguability on exertion.

Case 3. A 34-year old assistant fire chief was exposed to liquid and vaporized chlorobromomethane while perched in the nose wheel housing attempting to correct a mechanical arrangement. He was unnoticed by his contemporaries and was sprayed in the face with the liquid chemical for 40 seconds to a minute. He did not ingest any chlorobromomethane. Total exposure to the vapors was three to five minutes.

Ten minutes after exposure he became dizzy, but he maintained adequate orientation. Thirty minutes thereafter he was seized by a severe, throbbing pain in both temporal regions, and he complained of a burning sensation in his stomach. He vomited twice during the ensuing hour. Physical examination revealed only injected upper respiratory tract mucosae and conjunctivitis. One hour after exposure he was given 100 mg of meperidine hydrochloride intramuscularly, but the headache remained severe. He was referred for overnight hospital observation.

On his admission all routine laboratory tests were within normal limits. He was discharged to duty the following day. Three months after exposure the patient complained of bitemporal headaches of daily frequency, each lasting six or more hours. The onset was typical in each instance with pain beginning in one temporal area, becoming bilateral, and being unrelieved by acetylsalicylic acid, dextro propoxyphene, or other conventional analgesic agents. Otherwise, he was asymptomatic and in good health.

Comment. The diagnosis of acute chlorobromomethane toxicity will be made with difficulty without a history of exposure to the chemical. These patients were exposed to unaltered chlorobromomethane vapors and to vapors produced by the thermal decomposition of chlorobromomethane with gasoline; namely, carbon monoxide, small amounts of phosgene, chlorine, bromine,

hydrogen chloride, hydrogen bromide, soot, smoke, and other unknown breakdown products. It is not known which of these several compounds contributed to the toxic states, but it is probable that the unaltered chlorobromomethane vapor was a primary offender. Quantitative analysis of these breakdown products has not been recorded.

Table 1. Maximum Allowable Concentration

Carbon Tetrachloride	25 ppm
Methyl Bromide	20 ppm
Chlorobromomethane	400 ppm

The symptoms and signs of toxicity were referable to the gastrointestinal and central nervous systems. It is presumed that the basic offending substances were chlorobromomethane and the several bromide-ion-containing decomposition products. The amount of phosgene produced was considered insignificant.

This report on acute chlorobromomethane toxicity in human beings is thought to be the first so documented in the American medical literature. Toxicity followed inhalation of the chemical and its thermal decomposition products. The toxic syndrome was characterized by irritative gastrointestinal symptomatology and by irritative and narcotic central nervous system manifestations. These led to deep coma in two patients, one of whom exhibited uncontrollable convulsive movements. The second patient became totally apneic and was kept alive for two hours with oxygen and artificial respiration.

The treatment for chlorobromomethane poisoning is supportive. Drug therapy failed to alleviate the toxic symptomatology. Respirations must be controlled by manual restraint to prevent physical injury to the patient. No specific antidote for this type of poisoning is known, although dimercaprol has been shown to protect laboratory animals subsequently exposed to toxic halide compounds.

Chronic pathophysiologic derangements following chlorobromomethane exposure in man are not known. In view of the cited animal exposure studies, it is suggested that patients be followed closely on an outpatient basis to detect possible, subsequent hepatic and/or renal damage.

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Explosion Hazard of Combustible Gases, Vapors and Dusts

By W. L. Ball PhD, Occupational Health Division Department of National Health and Welfare, Ottawa. Occupational Health Bulletin 18(10):October 1963.

Explosion is the forceful expansion of gas. When this expansion occurs so rapidly that its pressure is dissipated by the rupture of containing vessels or buildings, serious property damage or injury to personnel may result.

Although this article is essentially a discussion of explosion from the combustion of air-borne material, it provides an opportunity to examine briefly the causes and prevention of explosions that result when gas pressure builds up by other means.

An expanding liquid exerts pressure over a short distance only and this force is so quickly dissipated that there is little hazard from a rush of liquid or the flying pieces of the containing vessel unless the liquid is hot or corrosive. Released gases, however, expand infinitely and the force of their expansion may cause damage and injury over a large area. There are three main sources of gas explosions: (1) Gas compressed by mechanical means, such as a pump, until some part of the containing vessel fails to withstand the pressure. (2) Stored gases or chemicals externally heated to the point where they rupture their containers. (3) Combustions of mixture of gases, vapors or dusts that build up high pressure.

Although combustion explosions differ from the first two because fire is more likely to follow, they are more complex and harder to avoid. Explosives and atomic fission will not be considered in this article. Their effect also is to cause the rapid expansion of gas.

The requirements for a combustion explosion are: (1) enough oxygen to support combustion; (2) a flammable substance; (3) a source of ignition. Even when these three requirements are present an explosion will not occur unless the flammable substance is at certain critical conditions.

Critical Conditions of Flammable Substances. Ignition temperature. Before an air-borne mixture can propagate a flame a portion of it must be heated to the ignition temperature—the minimum temperature at which rapid combustion becomes independent of external sources of heat. Because there is a lag (1 sec for hydrogen and about 100 sec for ethane) this temperature must be sustained. Factors that affect ignition temperature are: Percent of combustible material and oxygen in the mixture, size and shape of the container, pressure of the mixture. Ignition temperature is thus not a true physical constant.

Flash point. Flash point is the minimum temperature at which a liquid gives off sufficient vapor to form a flammable mixture and is a rough measure of its combustibility. Above the flash point combustion will occur if the ignition temperature is sustained long enough and the concentration is within flammable limits.

Flammable and explosion limits. The minimum concentration in air of a combustible that will burn are its flammable or explosion limits. Below the minimum there is insufficient combustible and above the maximum insufficient oxygen. Because the concentration of a volatile substance over its solid or liquid form, in a confined space, depends on its temperature, it may be seen that there is also a temperature range of flammability.

Temperature Range of Flammability. When the vapor and liquid or solid states of a substance are at equilibrium there is a minimum temperature below which insufficient air-borne material exists to burn and a maximum above which there is insufficient oxygen to support combustion. The temperature range of

flammability lies between these limits. The limits of flammability are affected to some extent by the direction of flame propagation, the shape, diameter and length of confining space, the temperature and pressure of the mixture, the percent of water vapor present and, indirectly, the source of ignition.

Some of the steps that should be taken to control the hazards of gas explosion are as follows: (1) Reduce the oxygen content of the mixture by absorption, catalytic combination, or the introduction of inert diluting gases or vapors such as carbon dioxide, nitrogen or the freons. (2) Operate outside the limits of flammability of the combustible material. For example, a liquid may be stored or used at a temperature below its minimum temperature of flammability. (3) Substitute less flammable materials. The use of helium instead of hydrogen in lighter-than-air craft is one of the oldest examples. (4) Eliminate ignition sources. The gasoline tanks of millions of automobiles contain flammable mixtures but explosions are rare because care is taken to keep ignition sources such as lighted cigarettes away from open tanks. (5) Segregate hazardous operations. Gas tanks, for example, are placed in fields some distance from buildings. (6) Provide adequate ventilation. Ideally, operations that evolve combustible or poisonous gases, vapors, or dusts should be carried out in the open. In practice, ventilation should be designed to reduce the concentration of combustible materials to non-explosive levels. (7) Use release diaphragms or vents. Many operations that normally run at comparatively low pressures may suddenly produce explosive pressures that will damage equipment and injure personnel if a release is not provided. (8) Follow the gas concentration with a combustible gas indicator. This should be routine in any operation where escaping combustibles may reach explosive conditions.

A few ounces of flammable liquid can support a dangerous fire, or if volatilized, cause an explosion. Such liquids should be: (1) Stored in rooms of non-combustible construction. (2) Descriptively labelled. (3) Guarded from sources of ignition. (4) Kept in tightly closed containers.

Tables of ignition temperature, flash points, limits of flammability, minimum explosion concentration, etc. are available for gases, vapors, and dusts, but their interpretation and application are complex. In fact, the determination of concentrations, their comparison with safe levels and the engineering steps that must be taken to make them meet acceptable limits should be left to experts in the field. Familiarity with the conditions that lead to explosions and the application of a few common-sense rules may, however, prevent a disaster.

While the foregoing recommendations apply particularly to gas and vapor explosions, dust explosions are similar in many ways. There are, however, differences in the physical properties of dusts that affect their explosion hazard. Because they are not as readily dispersed as gases and vapors, the likelihood of dusts forming explosive suspensions depends on the size and weight of their particles and the turbulence of the air. In a quiet atmosphere even the fine dust particles will eventually settle.

Sources of Ignition. Some sources of ignition follow: static discharges, electric sparks from motors, fuses, switches, etc., frictional sparks from

grinding wheels, hammers, etc., glowing particles from furnaces and fires, open flames, torches, matches and smoking.

Examples of gas explosions range from those caused by the ignition of the hydrogen generated in charging storage batteries to those which demolish a building. An explosion can travel through a gas transmission line faster then the splitting of the pipe can release the pressure. In December 1957 in the Township of Tustin, Ontario, a leak occurred in the 30 inch diameter high pressure line and explosion destroyed 3.37 miles of pipeline. Approximately 60% of gas explosions and 70% of fatalities are caused by leaks in distribution and service piping outside of damaged buildings.

In the laboratory a source of explosion is the refrigerator. Chemicals that are volatile at room temperature are often stored in a refrigerator. The main cause of these explosions, as determined by the Federal Department of Public Works, is the ignition of the flammable vapors by one or more of the eleven arcing points found in the average domestic refrigerator. Another cause is the pressure build up that follows power failure. Such explosions are very destructive of property and hazardous to personnel. Routine inspection of the contents and mechanism of the refrigerator is a good precaution but it also is wise to equip the refrigerator door with a magnetic lock that will release before the pressure builds up.

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Survey of the Most-Frequently Accidentally Ingested Products

National Clearinghouse for Poison Control Centers, USDHEW PHS, Washington D.C., pgs 1-4, September-October 1963.

A primary function of the National Clearinghouse for Poison Control Centers is analysis of the data reported by the centers. Currently, about half of the 511 centers throughout the country are using a standard report form (PHS-2805). In 1961 there were 42,000 cases submitted for statistical processing. Approximately 90 percent were reports of ingestions among children under 5 years of age. Summaries of the tabulations were distributed to the participating centers. Consolidated summaries were sent to the State Health Departments concerned and Public Health Service Regional Offices.

After coding and tabulation, the individual case histories are filed by category (such as laxatives, bleaches, tranquilizers, etc.) and then subdivided by trade name. This file serves to provide clinical information both on categories of products and on individual trade name items that make up each category.

An analysis of the accidental ingestions among children under 5 years of age shows that 10 categories out of 80 currently used accounted for approximately half the cases. The following table lists the relative frequencies of such ingestions during 1961.

Types of Substances	Percent of Total
1. Aspirin	21.8
2. Insecticides (exc. mothballs)	5.3
3. Bleach	4.4
4. Detergents, soaps, cleaners	4.3
5. Furniture polish	2.4
6. Kerosene	2.2
7. Vitamins and iron preparations	2.2
8. Disinfectants, deodorizers	2.1
9. Lye, corrosives	2.1
10. Laxatives	1.9

If suicides and accidental ingestions in persons 5 years and over were also considered, sedatives-barbiturates (4.5% of all ingestions) and tranquilizers (2.8% of all ingestions) would be included in the "top 10." However, since poison control centers are concerned primarily with accidental poisoning, the following observations will be confined to those categories of substances most frequently ingested by small children.

Individual case reports are on file for those ingestions reported to the Center since July 1959, a 30 month study period in which approximately 90,000 reports were analyzed. Within each of the "top 10" categories, the number of different products and the frequency of each were tabulated. Information concerning hospitalization was tabulated on the 10 most frequently ingested products within each of the "top 10." This report, then, would cover 100 individual products except that the kerosene category is not broken down by trade names.

On further review of the cases accumulated in this 30 month period, it was found that 34,651 reports identified the name of the ingested product in these "top 10" categories. Of 1722 different trade name products represented, 15 were reported 200 or more times, and 16 others were reported 100 or more times.

It was found that 15 products (acetyl salicylic acid, kerosene, and ammonia each counted as a single product) accounted for 0.9 percent of the individually identified products, but for 69.1 percent (23,940) of the cases. When the 31 products named 100 or more times were analyzed, 1.8 percent of the individually identified products accounted for 76.3 percent (26,425) of the ingestion cases. The remaining 1,691 products represented 98.2 percent of the identified substances but only 23.7 percent of the cases. Aspirin, of course, led the 10 most frequently ingested products with almost half of the cases, followed by "Clorox" (5.4%), kerosene (4.8%), "Ex-Lax" (2.9%), and "Drano" (2.9%).

Children hospitalized from these ingestions ranged from 6.0 percent to as high as 55 percent, with the figures based on the number of cases for which data concerning hospitalization were available. The criteria for hospitalizing an ingestion case vary from hospital to hospital. Many of the cases were

admitted either because of a hospital policy or for 24 hour observation. The average hospitalization for the 15 products was 20.6%, and 20% for the combined products in all of the selected groups of substances.

Products Among "Top 10" Substances Which Were Reported 100 or More Times July 1959-December 1961

	Product	Cases	% Hosp. *
1.	Aspirin	15,546	13.9
2.	"Clorox"	1,855	14.3
3.	Kerosene	1,656	39.3
4.	"Ex-Lax"	1,021	6.0
5.	"Drano"	989	50.9
6.	Ammonia	420	40.8
7.	"Pride" Furniture Polish	360	32.6
8.	"Lysol"	356	29.0
9.	"Old English" Polishes	303	50.3
10.	"Gator Roach Hives"	275	21.3
11.	"Lestoil"	262	27.9
12.	Lye	245	55.1
13.	"Purex"	240	13.0
14.	"Pine-Sol" Disinfectant	212	31.5
15.	"Black Flag"	200	25.5
16.	"Real-Kill"	194	26.3
17.	"Raid"	192	33.7
18.	"Windex"	173	3.1
19.	"Comet"	169	0.0
20.	"Harris Famous" Roach Tablets	168	5.6
21.	"6-12" Insect Repellent	168	8.5
22.	"Poly-Vi-Sol"	166	0.0
23.	"Mr. Clean"	162	13.8
24.	"Sani-Flush"	161	22.5
25.	"Carter's Little Pills"	161	7.5
26.	"Roman" Cleaner Bleach	158	6.5
27.	"Joy"	145	5.7
28.	"Chocks" Vitamins	127	0.0
29.	"Ajax"	121	13.6
30.	"Lilly's" Ant Cup	119	27.3
31.	"Easy-Off" Oven Cleaner	101	29.8
	Total 31	26,425	20.1
	Total Cases with trade names specified	34,651	20.0

* Based on cases with known information regarding hospitalization.

In analyzing ingestions among children under 5 years of age, the identification of the trade-name products most-frequently encountered was included for a number of reasons. When relatively few products account for the majority of ingestions, the necessity is clear for having the information on the ingredients, symptoms, and treatment for these cases instantly available. Because information is generally available on the more common products (whether by reason of volume of sales or popularity of the product), the less frequently mentioned products probably cause the poison control center the most difficulty. In the latter case, the formulations are less likely to be readily available, causing delay in the disposition of the child. In brief, the 15 products that are mentioned 200 times or more should be familiar to the doctors in the poison control centers, whereas the 5,000 to 6,000 products that have been ingested a fewer number of times will present greater problems.

On several occasions in these tabulations, the trade name mentioned on the report fails to specify the individual product of a company. Thus, several similar products with company trade name may be grouped together; examples of this are "Black Flag," "Real-Kill," "Raid," and "Old English" Furniture Polish. Other tables include merely a chemical identification, since this was the principal method of identifying the products when these cases were reported. Therefore, in one table both potash and lye are mentioned individually, although several of the products in the table might have contained either or both of these substances. Similarly, ferrous sulfate and ammonia are listed in their appropriate categegories. The tables, therefore, reflect the named products that were identified by the individual poison control centers and, although some of the lists might not be mutually exclusive, there are still many interesting and informative conclusions that might be made.

USDHEW PHS ANNOUNCEMENT

The Division of Occupational Health of the U. S. Public Health Service announced the release of "Preventing Dermatitis, If You Work With Epoxy Resins," PHS Publication No. 1040.

Since epoxy resins were introduced to American industry a few years ago, they have gained widespread usage. However, epoxy resins may cause troubling and disabling dermatitis, or skin disease, of employees who do not observe certain safeguards in working with the resins.

The new publication describes for the worker and his supervisor the hazards inherent in working with epoxy resins. Precautions for handling the materials, plant housekeeping procedures, and personal hygiene rules are outlined briefly and illustrated by simple line drawings. A listing of sources of additional information on the resins completes the leaflet.

Single copies of the publication are available from the Division of Occupational Health. Copies may be purchased from the Superintendent of Documents, U. S. Government Printing Office, Washington D. C. (10 cents each; a discount of 25 percent for orders of 100 or more).

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RESERVE SECTION

Naval Reserve Promotion Zones and Tentative Convening Dates

Listed below are the 1961 Register Numbers of the junior officer in each respective promotion zone.

Promotion to Rear Admiral

LINE	000116
21XX	000066
22XX	No board authorized
23XX	No board authorized
31XX	No board authorized
41XX	000003
51XX	No board authorized
XXX7	No board authorized

Promotion to Captain

LINE	007022
21XX	000373
22XX	000458
23XX	000075
31XX	000470
41XX	000137
51XX	000329
XXX7	011705-15

Promotion to Commander

LINE	013285
LINE(W)	000342
21XX	001065-50
22XX	000482
23XX	000168
31XX	000988
31XX(W)	000042
41XX	000201
51XX	000595
XXX7	023492-25

Promotion to Lieutenant Commander

LINE	023945
LINE(W)	000455
21XX	002164
22XX	001555-50
23XX	000176
31XX	002083
31XX(W)	000052
41XX	000328
51XX	000936
XXX7	043461

Promotion to the grade of lieutenant (male) will include all lieutenants (junior grade) with date of rank of 4 May 1962 and senior.

Promotion to the grade of lieutenant (Wave) will include all lieutenants (junior grade) with date of rank of 31 December 1961 and senior.

The Naval Reserve selection boards are scheduled to convene as follows:

Rear Admiral (Line and Staff)	7 Jan 1964
Captain (Line)	14 Jan 1964
Captain (Staff)	3 Mar 1964
Commander (Line)	21 Jan 1964
Commander (Staff)	3 Mar 1964
Lieutenant Commander (Line)	10 Mar 1964
Lieutenant Commander (Staff)	28 Apr 1964
Lieutenant (Line)	7 Apr 1964
Lieutenant (Staff)	28 Apr 1964
Warrant Officers	23 Mar 1964

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Navy Ensign 1915 Medical Program (continued)

Naval Internships (continued)

5. Salary. A medical school graduate accepted as an intern will be commissioned as lieutenant (junior grade), Medical Corps, United States Naval Reserve, and will receive the compensation and privileges of his rank. Interns with dependents receive approximately $ 10,715 per year while those without dependents receive approximately $ 10,414 per year. Currently, promotion to the rank of lieutenant usually occurs early in the internship training period. After such promotion, the amount received per year is the same as for a lieutenant (junior grade).

6. In order to become eligible for consideration for a naval internship, you must first register with the National Intern Matching Program. Application for the naval internship may then be secured by visiting or writing the nearest U. S. Navy Recruiting Station or the nearest naval hospital in the continental United States. In filling out an application form, we suggest you list five hospitals in order of preference. In most instances we have been able to make an assignment from among the first three listed.

7. Applications for intern training are accepted between 1 September and 1 December of each year. That portion of the application pertaining to internship is accepted between 1 October and 1 December in accordance with the provisions of the National Intern Matching Program.

8. In order to permit processing of your application in sufficient time to meet all deadline dates, it is suggested that you submit your application as early as possible after 1 September. Your attention is invited to the fact that naval

internships carry no obligated service requirement. Interns, if they so desire, may be released to inactive duty at the conclusion of their internship provided they have no obligation to serve on active duty under the Universal Military Training and Service Act, as amended, or under the Senior Medical Student Program.

9. Any additional information may be obtained upon request from the Bureau of Medicine and Surgery, Department of the Navy, Washington 25, D. C.

(To be continued)

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